

What Is Claimed Is:

1           1. A method of finding rules and exceptions from a database is characterized by  
2           adopting four stages and their realization on computers, the four stages comprising:  
3                     an adaptive stage for creating a parameter file as the rules and exceptions finding  
4           conditions according to the receipted specification that is decided by a user, and displaying  
5           the result of generated rules and exceptions to the user;

6                     a data model stage for analyzing the parameters from said parameter file and  
7           retrieving data from one or more databases according to the parameters;

8                     a problem formulator stage for transforming said retrieved data into a formalized  
9           data structure suitable for said parameters, and creating the possible catalog of attributes; and

10                    a solving stage for generating rules and exceptions from said formalized data by  
11           using said parameters and said catalog, and sending the result to said adaptive stage.

1           2. The method of Claim 1, wherein said solving stage further includes three sub-  
2           stages, comprising:

3                     a getsupport sub-stage for computing the support number of each attribute  
4           combination from said attribute catalog;

5                     a getrule sub-stage for determining the confidence for the attribute  
6           combination based on said support number, and then finding the rules that can meet the  
7           condition restricted by said parameters, and then determining the exceptions according to said  
8           existing rules and the maximum exception number given by the parameter file; and

9                     a getresult sub-stage for saving said rules and exceptions that are generated in

10 said getrule sub-stage into a text file.

1 3. The method of Claim 2, wherein the getsupport sub-stage computes said support  
2 number by adopting a bitmap method which computes the bitmap value of said each attribute  
3 combination.

1 4. A program for the computer realization of a method to find rules and exceptions  
2 from a database characterized by adopting four stages, said four stages comprising:  
3 an adaptive stage for both creating parameter file as the rules and exceptions  
4 finding conditions according to the receipted specification that is decided by a user, and  
5 displaying the result of generated rules and exceptions to the user;  
6 a data model stage for both analyzing the parameters from said parameter file,  
7 and retrieving data from a database according to the parameters;  
8 a problem formulator stage for both transforming the retrieved data into a  
9 formalized data structure suitable for the parameters, and creating the possible catalog of  
10 attributes; and  
11 a solving stage for both generating rules and exceptions from the formalized  
12 data by using the parameters and the catalog, and sending the result to the adaptive stage.

1 5. The program of Claim 4, wherein said solving stage comprises three sub-stages  
2 including:  
3 a getsupport sub-stage for computing the support number of each attribute

4 combination from the attribute catalog;  
5 a getrule sub-stage for both obtaining the confidence for each attribute  
6 combination based on the support number, and finding the rules that can meet the condition  
7 restricted by the parameter file, and then obtaining the exceptions according to the existing  
8 rules and the maximum exception number given by the parameter file; and  
9 a getresult sub-stage for saving the rules and exceptions that are generated in  
10 getrule sub-stage into a text file.

6. The program of Claim 5, wherein said getsupport stage computes the support number by adopting the bitmap method which computes the bitmap value of each attribute combination.

7. A computer readable recording medium which has recorded therein a program for the computer realization of a method used to find rules and exceptions from a database characterized by adopting four stages, the four stages comprising:

4 an adaptive stage for both creating a parameter file as the rules and exceptions  
5 finding conditions according to the receipted specification that is decided by a user, and  
6 displaying the result of generated rules and exceptions to the user;

7 a data model stage for both analyzing the parameters from said parameter file, and  
8 retrieving data from a database according to the parameters;

9 a problem formulator stage for both transforming the retrieved data into a  
10 formalized data structure suitable for the parameters, and creating the possible catalog of

attributes; and

a solving stage for both generating rules and exceptions from the formalized data by using the parameters and the catalog, and sending the result to the adaptive stage.

8. The recording medium of Claim 7 further including recorded therein a program for three sub-stages of said solving stage, the three sub-stages including:

a getsupport sub-stage for computing the support number of each attribute combination from the attribute catalog;

a getrule sub-stage for obtaining the confidence for each attribute combination based on the support number, and then finding the rules that can meet the condition restricted by the parameter file, and then obtaining the exceptions according to the existing rules and the maximum exception number given by the parameter file; and

a getresult sub-stage for saving the rules and exceptions that are generated in getrule sub-stage into a text file.

9. The recording medium of Claim 8 further including recorded therein, a program for said getsupport sub-stage for computing the support number by adopting the bitmap method to compute the bitmap value of each attribute combination.